

Appl. No. : **10/804,520**
Filed : **March 19, 2004**

AMENDMENTS TO THE CLAIMS

Please cancel Claims 18-88 without prejudice or disclaimer.

Claims 9, 11, and 12 are withdrawn for the purpose of responding to the Restriction Requirement.

A complete listing of all claims and their current status is presented below.

1. (Original) A two-mode plasma containment apparatus, comprising:
a plasma disposed within a containment volume having a containment dimension, said plasma comprising a number of electrons and a number of ions, and wherein said electrons act as charge carriers in a current established in said plasma; and
a magnetic field that influences said electrons substantially more than said ions such that said electrons are magnetically confined as a first mode of confinement to an electron confinement volume that is smaller than said containment volume so as to cause at least a partial separation in distributions in said number of electrons and said number of ions, wherein said separation induces an electrostatic field that facilitates confinement of said ions as a second mode of confinement within said containment volume.
2. (Original) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 1000 electron skin depths.
3. (Original) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 100 electron skin depths.
4. (Original) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 60 electron skin depths.
5. (Original) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 40 electron skin depths.
6. (Original) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 10 electron skin depths.
7. (Original) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 2 electron skin depths.

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8. (Original) The apparatus of Claim 1, wherein the electron confinement volume has a dimension of approximately 1.2 electron skin depths.

9. (Withdrawn) The apparatus of Claim 1, wherein the containment volume is substantially cylindrical in shape.

10. (Original) The apparatus of Claim 1, wherein the containment volume is substantially toroidal in shape.

11. (Withdrawn) The apparatus of Claim 1, wherein the electrons are confined by the magnetic field using Z-pinch confinement.

12. (Withdrawn) The apparatus of Claim 1, wherein the electrons are confined by the magnetic field using theta-pinch confinement.

13. (Original) The apparatus of Claim 1, wherein the electrons are confined by the magnetic field using a combination of Z-pinch and theta-pinch confinement.

14. (Original) The apparatus of Claim 1, wherein operating parameters of the plasma are subject to a restriction in a beta value associated with the plasma, wherein the beta value depends on factors comprising average number density, temperature of the plasma, and strength of the magnetic field.

15. (Original) The apparatus of Claim 1, wherein a contribution of the electrons to the current is relatively more than a contribution of the ions to the current.

16. (Original) The apparatus of Claim 1, wherein a bulk motion of the electrons in the plasma is relatively more than a bulk motion of the ions in the plasma.

17. (Original) The apparatus of Claim 1, wherein a flow of the electrons in the plasma is relatively more than a flow of the ions in the plasma.

Claims 18-88 canceled.